

# Draft Document For Discussion Only (9-14-2016)

## Purpose of this Document

This document addresses the remaining FDOT review comments that were included with the 90% foundation design. The remaining review comments were not highlighted by FDOT since the comments were not related to the foundation design.

With this understanding, the following supplemental clarifications (in green text) are provided for the Department's consideration. These clarifications follow the original comment numbering/lettering scheme without change. In addition, the highlighted comments are removed from this document since they were addressed in the meeting that was held on June 29, 2016.

## Reference Clarification

In the clarifications below, the acronym SDG refers to the January 2015 Structures Design Guidelines, FDOT Structures Manual, Volume 1 which is applicable to the project.

## Clarifications to Remaining Comments (non-highlighted comments)

Comments 1 thru 22 below are for information only. No response is required. The comments are intended to assist in progressing the DBF's concept to 90%.

### 1. General:

- a. See CADD Manual, pg. 4-41 thru 4-47 for structures plans naming and numbering convention and sheet order.

**Clarification:** The updated standard file naming and numbering convention follows FDOT CADD Manual. The sheet order has been organized in order to follow the RFP schedule requirements for design packages deliverables.

<http://www.dot.state.fl.us/ecso/downloads/publications/manual/CADDManual2015/Files/10.1.15/CADDManual2015.pdf>

- b. Include bridge geotechnical report and borings in next submittal.

**Clarification:** The geotechnical report and boring were submitted with the 90% foundation submittal.

- c. Include Traffic Control Plans for SW 8<sup>th</sup> Street in next submittal.

**Clarification:** The Traffic Control Plans were submitted with the 90% Roadway submittal.

- d. Is the C/L Structure & PGL baseline tied-in via survey? Include project survey control sheets in next submittal.

**Clarification:** The C/L & PGL baseline of the pedestrian bridge is tied-in to the US 41 alignment. This information is shown on the GP&E drawing.

- e. Locate and show all existing utilities within the project limits in next submittal.

**Clarification:** The existing utilities have been included in the GP&E drawing, and Foundation layout drawing.

2. Sheet B-2:

- a. Include a note for lightning protection design criteria. fib Bulletin No. 30 "Acceptance of Stay Cable Systems using Prestressing Steels", NFPA 70 (National Electric code) and NFPA 780 (Standard for the Installation of Lightning Protection Systems).

**Clarification:** The fib lightning protection design criteria is not applicable to this project. The pipe supports connecting the upper pylon with the superstructure are not a stay cable system using prestressed steel. However, the suggested note for the lightning protection will be provided on the electrical plans (NFPA 70 and NFPA 780).

- b. Expand "Screeding Deck Slab Note" to say: ...TO ENSURE A UNIFORM TEXTURE OF THE FINAL COMPLETED STRUCTURE." to ensure that the CIP and precast deck interfacing surfaces also meet finish requirements.

**Clarification:** The note has been modified.

- c. Rename "Deck Planing and Profilographing" note title to "Deck Finishing" since the short-bridge criteria will be used.

**Clarification:** The note has been renamed.

- d. Note 4: If SIP Forms are permitted, the designer needs to include the dead load (forms and the weight of the concrete to fill the flutes) which were assumed in the design.

**Clarification:** The note has been revised to say that "Stay-in-Place form is not permitted".

- e. Future Bearing Replacement: Include a step to unbolt the bottom stay pipe connection (Detail B, Sheet B-16) prior to jacking span or incorporate Comment 11.c below.

**Clarification:** A note has added to the pipe support members drawing stating that the connections between the superstructure and the pipe shall be unbolted prior to bearing replacement.

- f. Per, SDG 2.4.1.E, since bridge is higher than 75 ft. Evaluate gust factor per ASCE/SEI 7-

05. Show gust factor G that was used in General Notes.

**Clarification:** The top of the superstructure is only located 40 ft above the ground elevation and the span length is less than 250 ft. FIGG believes that this information is not required on the general notes. For gust factor applied to the pylon, see the submitted foundation calculations (pages 24 and 26 of pdf file).

3. Sheet B-3:

- a. See SDM Chapter 7 for PLAN AND ELEVATION DRAWING requirements.

**Clarification:** The 30% preliminary plans have been updated since the time of the initial review. See the 90% foundation drawings for the revised PLAN AND ELEVATION drawing.

- b. Call-out the existing overhead utility. Is it to remain? Can it be shut down? Is this an electric line? If so, include voltage. Is the clearance the minimum distance or the vertical distance? Clarify.

**Clarification:** The overhead utility line will be relocated further south from its existing location. It is FIGG understanding that FPL is completing all the details regarding the relocation of the overhead line at this time. The clearance is the minimum distance and the drawing has been updated to clarify this.

- c. Review strain-compatibility implications created by part of the continuous (for LL) structure being founded on deep foundations and part founded on spread footings. Although there is likely surface rock at the site, any settlement of the abutments relative to the pylon need to be accounted for in the design.

**Clarification:** The differential settlement between the pylon foundation and the spread footing is expected to be less than  $\frac{1}{4}$ ". Differential settlement has been accounted in the design of the superstructure.

4. Sheet B-4:

- a. Show cross slope on both sides of the section.

**Clarification:** The cross section is symmetrical about center line of the structure.

- b. Gradual drainage pipe slopes will be difficult to maintain. Greater slopes would be self-cleaning. Also design-in sufficient longitudinal slope of canopy to avoid ponding water. Provide pipe cleanout details during final design and verify that 8 inch diameter pipe is sufficient.

**Clarification:** The 1% longitudinal slope meets the design requirements, see bridge drainage calculations for details. Pipe cleanout details are provided in the superstructure submittal and the drainage calculations show that 8 inch diameter pipe is adequate.

5. Sheet B-5:

- a. Spread footing layouts do not match B-19 thru B-21.

**Clarification:** The drawings have been revised. See 90% foundation submittal.

- b. See SDG 3.8 for spread footing requirements.

**Clarification:** Understood.

- c. See SDM, Chapter 11 for foundation layout sheet requirements.

**Clarification:** Understood.

- d. Show critical temporary walls which are required to construct pylon footing alongside SW 8<sup>th</sup> Street.

**Clarification:** The drawing has been revised. See 90% foundation submittal.

- e. Include Roadway Plan Set which includes requirements for traffic control and pavement and striping restoration of SW 8<sup>th</sup> Street required to facilitate the Pylon footing construction under existing roadway.

**Clarification:** See 100% Roadway Plan for traffic control requirements. The pavement and striping restoration detail will be included in design package 4.

6. Sheets B-6 and B-7: Bury top of footing a minimum of 3'-0" below finished ground per SDG 3.11.2.C.

**Clarification:** The drawings have been revised to show a minimum of 3'-0" cover for the pylon foundation.

7. Sheet B-8:

- a. It is unclear why the 3" CIP vertical closure joint is required. Recommend maintaining a 2 ft. closure pour throughout. Issues with the 3" CIP vertical closure joint include:
  - i. Ability to consolidate grout/concrete in the 3" vertical gap.
  - ii. Ability to splice PT bar duct.
  - iii. Ability to accommodate fit-up with hauling deflection (SPMTs) shape versus in-place self-weight deflection shape during element placement.

**Clarification:** The back span will be poured in-situ, therefore the vertical closure joint is not required.

- b. The vertical PT. ducts located in the precast truss elements (both spans) need to be oversized to facilitate fit-up.

**Clarification:** The PT ducts are sized according to AASHTO LRFD requirements and FDOT SDG section 4.5.12.

- c. It is unclear how pylon pier is connected from the underlying pier element-up thru the bottom walkway around the web element and thru the canopy.

**Clarification:** The connection details between the base of the pylon and superstructure were submitted with the 90% substructure plans. See details for clarification. In addition, a 3-D drawing that shows this connection was submitted with ERC review comments for the 90% substructure submittal.

- d. Show duct for the continuity tendon in Section A-A.

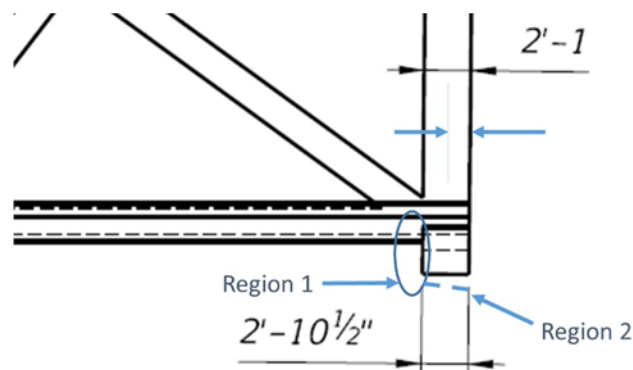
**Clarification:** The continuity tendons have been shown in the 90% substructure submittal.

- e. Experience has shown that full-continuous-for-LL behavior which is assumed in design may not be achieved in the structure because of camber growth over time. Consider adding additional continuity bars/tendons in the bottom walkway element and sequence construction as follows: Pour walkway closure, stress walkway continuity bars/tendons, pour remaining closure, and then stress canopy continuity tendons. That way the bottom is pre-compressed in the vent of camber growth.

**Clarification:** Our time dependent analysis indicates the camber growth is not a concern. In fact, 18 foot superstructure deflects approximately one half inch between end of construction and day 10,000 adding more compression to the bottom deck.

8. Sheets B-9 and B-10:

- a. Care needs to be taken to avoid issues associated with elastic shortening of the elements during stressing of longitudinal tendons. For instance the form has to be designed to be compressible or removable (region 1), and embedded skid plates need to be embedded in such a way that the heel does not spall or crack as the element cambers up and drags on its heel (region 2).



**Clarification:** Understood. The elastic shortening effect has been considered into account during the stressing of the longitudinal tendons. The form details are being discussed with MCM at this time.

- e. The concrete mix design needs to be flowable concrete or SCC to minimize potential for honeycombing of the element especially in areas where the concrete is cast under overlying formed surfaces (such as diagonals).

**Clarification:** The proposed concrete mix design will considerate the geometry of the diagonal members and its flowability in order to minimize the potential of imperfections in the members.

10. Sheet B-13:

- a. Verify stability of the structure during fabrication as the outer two ends of the walkway support beams are cambered upward due to the transverse PT in the deck.

**Clarification:** The transverse tendons will be stressed after all the components of the superstructure (deck, diagonal members, and canopy) are cast. The deck camber in the transverse direction will not affect the stability of the 175' span.

11. Sheet B-16:

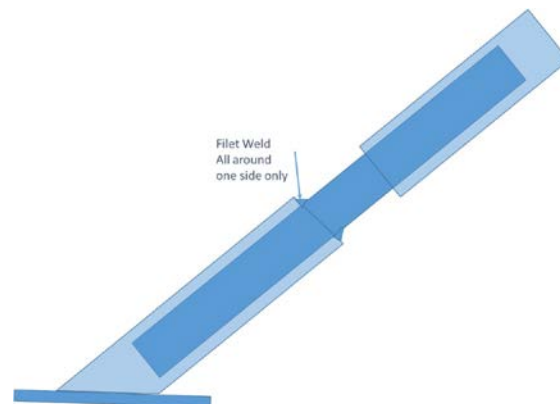
- a. The longest pipe (145'-9") will deflect 2.44 inches under its own dead load. This assumes a standard pipe wall thickness. Even thicker walled 16 inch pipes appear to be unacceptable solutions. Consider a 20 inch or 24 inch O.D. with an X-Heavy wall thickness for the longest pipe and a standard pipe thickness for the rest.

**Clarification:** The final deflection of the pipe is influenced by the contractor's handling procedures. It is bounded by the simple span and fix-fix conditions. The pipes will be chord cambered during welding, with camber values consistent with the contractor's means and methods, in order to have a near straight appearance.

- b. Are the anchor bolts to be embedded in the members? Avoid drill and epoxy options if possible. See suggested detail below in item C to facilitate fit-up.

**Clarification:** The anchor bolts are embedded in the members. The steel plates will have slots to accommodate any construction tolerances.

- c. The pipes will be a maintenance issue long term. Will they be galvanized and then painted. How will inside of pipe be maintained if it is not galvanized? Pipes will attract live loads, thermal loads, and wind loads. See suggested detail (tight fitting inner slide pipe) below to avoid stressing of the pipes. Require pipes to be completely sealed against rain intrusion.



**Clarification:** The pipes are black carbon steel and will be powder coated for long term protection. The connection details have been designed to accommodate all the transient loads. The suggested detail above will not provide the axial stiffness needed to achieve the required natural vertical frequency of the structure.

- d. Given the sharply acute angles - How is quality welded insured? Also it is nearly impossible to inspect / perform NDT.

**Clarification:** FIGG has contacted a specialty welding consultant to develop a welding procedure for the sharply acute angle pipes.

13. Sheet B-26:

- b. Outside of the roadway pavement limits, the SPMTs will have to roll on steel plates or mats. Show on this sheet or B-27.

**Clarification:** A full detailed SPMT movement plan will be submitted by the transporter's subcontractor for approval. The details of the movement plan will not be included with the bridge plans.

- c. Require shop drawings for the SPMT move in final plans – give requirements related to maximum twist and differential boundary conditions during the move to avoid cracking of the element.

**Clarification:** The maximum twist and differential boundary conditions during the move will be coordinated with the SPMTs subcontractor.

16. Sheet B-28, Step 5: Include continuity stressing steps. See Comment 7.e above.

**Clarification:** The continuity stressing steps has been included on the erection sequence drawings.

17. Sheet 10 of 106: Lighting should meet IESNA and CPTED (crime prevention strategies thru environmental design).

**Clarification:** Lighting will meet the RFP document requirements.

18. Sheet 15 of 106: Flat area included curb element will attract skate boarders.

**Clarification:** Noted.

19. Sheet 16 of 106: Follow CPTED standards: Keep tree branches > 6' above ground, and ground cover/shubs below 2' tall to eliminate hiding places.

**Clarification:** Noted.

20. Sheet 17 of 106: Benches should have center arm rest or similar to keep people from sleeping on them.

**Clarification:** Noted.

21. Sheet 55 of 106: Panels create an opportunity for local artwork – creates ownership and reduces vandalism.

**Clarification:** The suggested idea for panels on the fence will need to be approved by the owner (FIU).

22. Sheet 92 of 106: Follow CPTED Guidelines – cut off fixture, reduced glare, etc.

**Clarification:** The lighting designer is following the crime prevention through environmental design (CPTED) guidelines.